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CALIFORNIA BIRDS

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BREEDING DISTRIBUTION AND HABITAT PREFERENCE OF THE GRAY VIREO IN NEVADA

Ned K. Johnson

In the northern portion of the breeding range of the Gray Vireo *(Vireo vicinior)* in Nevada, published records of occurrence are based on seven specimens from four localities and sight records from an additional five stations scattered over southern Nye, southern Lincoln, and Clark counties (Linsdale, 1936; Miller, 1946; Gullion et al., 1959; Hayward et al., 1963; and Johnson, 1965). The present note summarizes the aforementioned records and adds new information on occurrence at five localities, one of which extends the known breeding distribution of the species approximately 50 miles to the north (Fig. 1). These data document the occurrence of the Gray Vireo to the northern limits of the Mohave Desert in Nevada. All but two of the specimens (number shown within parentheses) in the following tabulation are stored in the Museum of Vertebrate Zoology where their identifications have been verified. Dates and initials of observer are indicated after sight records. Gullion et al. (1959) provided no dates or supplementary detail for their sight records; therefore these places of supposed occurrence may not be breeding localities and they are queried on the map.

NYE COUNTY: Grapevine Mountains–Wood Cañon (1, not examined); Phinney Canyon, 6000 ft, at 3 mi E Grapevine Peak (1): Phinney Canyon, 6700 - 6900 ft, at 2½ mi E and 1 mi S Grapevine Peak (singing on territory, 18 and 20 May, 1971; NKJ). Nevada Test Site, Pahute Mesa-Shoshone Mountain area (1, not examined). 1½ mi SW Oak Spring, 5850 ft (southeast of Belted Range; close to 37° 15'N, 116° 5'W) (1).

LINCOLN COUNTY: 1¾ mi N and 1½ mi W Caselton, 6100 ft (1); Wheeler Ranch, 6600 ft, E side Highland Range (singing on territory, 22 June 1972; NKJ); 1½ mi N Mount Irish Peak, 7400 ft (1); Clover Mountains, Tule Desert, and Mormon Mountains, (no dates; GWG).

CLARK COUNTY: Hidden Forest Canyon, 6100 - 6500 ft, Sheep Range; 2½ mi E Cold Cr. Field Station, 6200 ft, Spring Range (singing on territory, 24 May 1971; NKJ); N side Potosi Mountain, 5800 - 6000 ft (3); Potosi Pass,

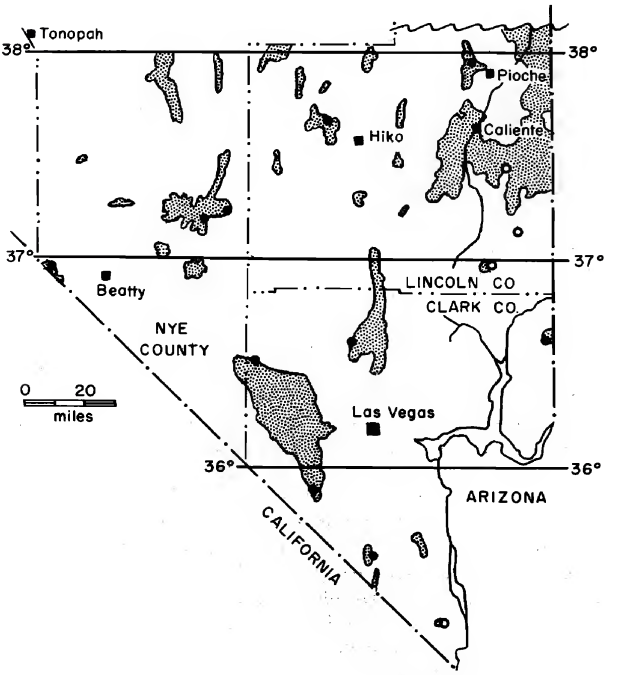

Figure 1. Map of southern Nevada showing known localities of occurrence of the Gray Vireo *(Vireo vicinior)*. Records at presumed breeding stations are indicated by dots. Records for localities where breeding is uncertain are indicated by circles. Approximate extent of woodland and/or forest zones in the highlands is shown by stippling. Note the location of many of the localities for vireos near the margins of the woodland-forest zone.

6300 ft (pair on territory, 24 May 1971; NKJ); ¾ mi E and ¾ mi S Virgin Peak, 5400 - 6100 ft, Virgin Mountains (8); ½ mi E Big Pine Spring, 5400 ft, McCullough Range (two pairs on territories, 23 May 1972; NKJ); Dead Mountains (no date; GWG). Gullion et al. (1959) mention the occurrence of the Gray Vireo at Boulder City and in Las Vegas Valley; these records presumably pertain to transients.

From these locality data, and from notes on ecologic occurrence, I can summarize the status of this species in Nevada. Here, as elsewhere on the Mohave Desert, the Gray Vireo usually occurs at low density, occupying remote slopes and canyon bottoms over a relatively narrow elevational range between 5400 and 6600 feet (rarely to 7400 feet) at the lower edge of piñon *(Pinus monophylla)*-juniper *(Juniperus osteosperma)* woodland (Fig. 1). As Grinnell and Miller (1944: 386) noted, "Dry chaparral, which forms a continuous zone of twig growth from one to five feet above the ground" is the preferred habitat. In the Virgin Mountains of Clark County this vireo occurred at unexpectedly high density, with numbers perhaps comparable to those reached in coastal southern California chaparral where Grinnell and Swarth (1913: 293) estimated 16 pairs per square mile in chamise *(Adenostoma fasciculatum)* in the San Jacinto Mountains. The vireos in the Virgin Mountains occupied mountain-mahogany *(Cercocarpus ledifolius)*, Gambel oak *(Quercus gambelii)*, and Mexican manzanita *(Arctostaphylos pungens)*. Gullion et al. (1959: 296) and Kay and Bradley (1968: 72-73) comment on the unusual development of the mixed chaparral formation in this range. Clearly, the designation of the Gray Vireo as an inhabitant of the "most arid scrub" (Barlow et al., 1970: 395) or of the arid "lowlands" (Hamilton, 1958: 311) does not apply in the region under discussion.

The northernmost records for the species, from the foothills on the east side of the Highland Range near Caselton in Lincoln County, were obtained in an area of diverse shrubland and low woodland of spaced juniper and sagebrush *(Artemisia tridentata)*, where squaw apple *(Peraphyllum ramosissimum)* and cliff rose *(Cowania stansburyana)* grew in profusion with several other unidentified species of small shrubs. The Gray Vireo was numerous here; several males sang along one-half mile of road. A male in active breeding condition (singing; left testis, 5 x 3 mm) was collected; it interacted with a presumed mate. Nearby areas grown to juniper and sagebrush, but without the other species of shrubs, lacked the vireo.

In view of continuing interest in habitat distribution and sympatry of vireos (Hamilton, 1959 and 1962; Barlow et al., 1970; Williamson, 1971) I offer the following remarks on the ecologic relationships of

the Gray Vireo and the Solitary Vireo *(Vireo solitarius plumbeus)* during the nesting season in southern Nevada. These species are both members of the subgenus *Vireo; V. vicinior* is a "thicket forager" and *V. solitarius* is an "arboreal forager" (Hamilton, 1958: 310-311), and thus one might assume that they could stratify if sympatric. I have observed both *V. vicinior* and *V. solitarius* on breeding territories in six different mountain ranges in southern Nevada. The Gray Vireo has been studied in two other ranges where Solitary Vireos apparently do not nest. Only in the Grapevine Mountains, Nye County, and on Mount Irish, Lincoln County, have the two species been found as closely as approximately one-half mile. In the former range the Gray Vireo has been recorded along Phinney Canyon from 6000 to 6900 feet elevation and I have found the Solitary Vireo on the slope above the same canyon between 6900 and 7500 feet elevation. On Mount Irish I recorded the Gray Vireo once at 7400 feet elevation and found the Solitary Vireo one-half mile distant at 6900 feet elevation, at 7800 feet, and again at 8100 feet. In the other four mountain ranges the Solitary Vireo always has been located at mid-elevations one mile or more upslope from the sites of occurrence of the Gray Vireo in the foothills. In such places the Solitary Vireo prefers either forest of ponderosa pines *(Pinus ponderosa)* or heavy woodland of mature piñon. Mountain-mahogany and/or Gambel oak occasionally is present as a subdominant. I have never observed overlap between the Gray Vireo and the Solitary Vireo in Nevada, but contact may occur infrequently where the chaparral and scattered woodland preferred by *V. vicinior* intermixes at its upper elevational edge with the lower border of the ponderosa pine forest or heavy piñon woodland inhabited by *V. solitarius*. Depending upon slope, exposure, and latitude (Wells and Berger, 1967), such contact could occur between approximately 6500 and 7500 feet elevation.

Evidently the habitat intermixture in certain portions of Arizona permits greater contact of the two species than is seen in Nevada toward the northern edge of the range of the Gray Vireo. For example, Barlow et al. (1970) reported several instances of "habitat co-occupancy" of *V. vicinior* and *V. solitarius* in Grand Canyon National Park, Coconino County, and presented results of limited experiments with playback of tape-recorded songs which suggest the possibility of interspecific territoriality. In Nevada, not only do the distinctive habitat preferences of each species seem to preclude such interactions, but it is also significant that neither form in allopatry has ever been found on a breeding territory in habitat that appeared

even marginally suitable for occupancy by the other form.

Thus, Hamilton's (1962) thesis, that local sympatry is rarely found in members of the same subgenus within *Vireo*, seems supported by the present evidence. Furthermore, P. Williamson (1971) in an elegant analysis clearly has demonstrated the existence of species-specific foraging movements in the Red-eyed Vireo *(V. olivaceous)*, Yellow-throated Vireo *(V. flavifrons)*, and White-eyed Vireo *(V. griseus)*, and of important differences in foraging sites of the sexes of *V. olivaceous*. Therefore, although differences in gross habitat preferences and stratification among vireos may prevent substantial contact between species, when contact does take place subtle additional differences in behavior and ecology can come into play. Presumably such differences serve to reduce even further interaction and competition.

Figure 2. Habitat of Gray Vireo in mixed chaparral and open woodland of pinon, juniper, serviceberry, and scrub oak on the north slope of Potosi Mountain, 6300 feet, Clark County Nevada. Photograph taken on 25 May 1971.

Photo by Ned K. Johnson

Gene M. Christman drafted the final version of the map and Robert Ornduff identified several shrubs. Lynn Carpenter, Robert E. Jones, and Alexander K. Johnson provided assistance and companionship in the field. These data were obtained incidental to research dealing with speciation in the Solitary Vireo, which is supported in part by the Committee on Research, University of California, Berkeley.

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AGE AND SEX COMPOSITION OF WESTERN SANDPIPERS ON BOLINAS LAGOON

Gary Page, Barbara Fearis, Ronald M. Jurek

INTRODUCTION

There is limited information on the age and sex composition of shorebirds (Charadrii) at migratory stopover points between the breeding and wintering grounds (Jehl, 1963; Mascher, 1966; Page and Bradstreet, 1968) and on the wintering grounds (Holmes, 1966). There are few comparable data for the Western Sandpiper *(Calidris mauri).* We have been collecting data on the age and sex composition of this species at different times of the year on Bolinas Lagoon, Marin County, California. Our data show that adult and immature birds migrate at different times in the fall and that males and females migrate at different times in the spring. Further, we found that male and female Western Sandpipers have somewhat different wintering areas; to our knowledge, this is the only sandpiper for which such evidence currently exists.

The Western Sandpiper breeds chiefly in Alaska and winters from California and the southern United States to Venezuela and Peru. Details of the distribution can be found in Bent, 1927; Palmer, 1967; and Holmes, 1971.

METHODS

The major part of the study was conducted on Bolinas Lagoon, a 570-hectare estuary, 24 kilometers northwest of San Francisco, California. We made 71 censuses of Western Sandpipers on Bolinas Lagoon between 1 June 1971 and 31 May 1972 and trapped many of the sandpipers in 1971 and 1972. Birds were considered adults if they lacked buffy edges on all their upper wing coverts and tertials and immatures (less than one year of age) if they had buffy edges on at least some of these feathers. Some immatures may lose all their buffy-edged feathers in the spring molt; consequently, after late March we did not age birds. The sex of the birds was determined from their bill lengths using the methods described by Page and Fearis (1971). Birds were considered males if their bill lengths were $\leqslant$ 24.2 mm and females if their bills were $\geqslant$ 24.8 mm. To compare the

results from Bolinas Lagoon with other locations we examined the age and sex composition of birds trapped at Limantour Estero, 11 kilometers northwest of Bolinas Lagoon, and examined museum skins of Western Sandpipers from North America, South America, and the West Indies. A few specimens were not included in the study because the length of the birds' bills indicated a different sex than the specimen label. The sex composition of Western Sandpipers in other areas of California was also determined from bill measurements of birds trapped by one of the authors or other persons listed in the acknowledgements. In these samples bills were measured only to the nearest 0.5 mm and birds with bills $\leq$ 23.5 mm were considered males and $\geq$ 25.5 mm females. To test if the sex ratios of the sandpipers from different locations varied from an expected ratio of 1:1, we used the Chi-square test. Birds of unknown sex were not included in the calculations of the sex composition.

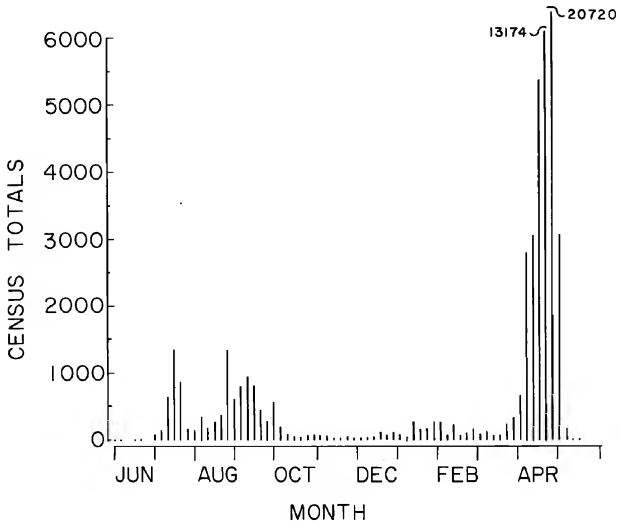

Figure 1. Number of Western Sandpipers on Bolinas Lagoon, California, June 1971 to May 1972.

NUMBER, AGE, AND SEX OF WESTERN SANDPIPERS ON BOLINAS LAGOON

The number, age composition, and sex composition of Western Sandpipers on Bolinas Lagoon varied during the study. The largest numbers of Western Sandpipers occurred in the spring and fall migrations and only small numbers of birds occurred during the winter (Figure 1). In July a peak in numbers (Figure 1) marked the fall passage of adults through the area and in late August and September another peak marked the passage of immatures. This agrees with Holmes' (1972) observation that adults leave the breeding grounds by the end of July while immatures stay into August. Female Western Sandpipers were as abundant as males during the peak periods of both passages but by the end of the adult passage in late July and early August adult males outnumbered adult females by 8:1 and by the end of the immature passage in late September and early October immature males outnumbered immature females by 8:1 (Figure 2). On spring migration Western Sandpipers occurred on Bolinas Lagoon in numbers which greatly exceeded the number at other times of the year (Figure 1).

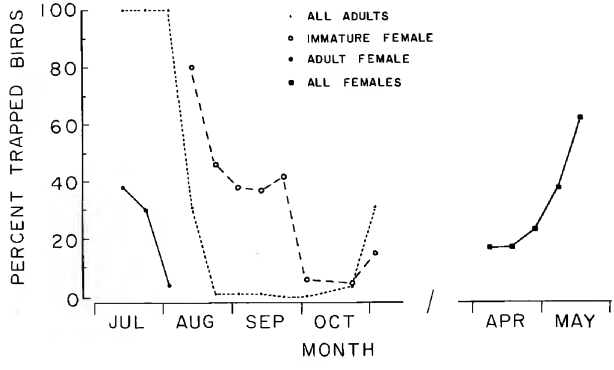

Figure 2. Age and sex composition of Western Sandpipers on Bolinas Lagoon, California in the autumn 1971, with spring sex composition data for 1971 and 1972 combined. Sex composition shown is for known-sex birds only. Sex compositions of adults and immatures are calculated separately. Sample is 1200 birds; minimum sample for any point is 11 birds.

During most of this spring passage males outnumbered females (Figure 2) but by late April and May, when the number of spring migrants on Bolinas Lagoon was declining, the female to male ratio increased (Figure 2). It was evident that males migrated before the females in the spring. In the winter, early October 1971 to late March 1972, the number of Western Sandpipers on Bolinas Lagoon fluctuated between 13 and 286 birds. From early October to mid-January there was an average of 55 (range 13 to 107 birds on the estuary and from mid-January until late March an average of 155 (range 77 to 286) birds. A few Western Sandpipers, marked between July and September, remained throughout the winter. Others marked after September were found at Limantour Estero before late March indicating some local movement of birds prior to migration. Between early October and late March we captured 64 birds of which 80% were immatures. Of the immatures, 86% were males; of the adults, 92% were males. It was apparent that male Western Sandpipers outnumbered females on Bolinas Lagoon in the winter of 1971-72.

SEX COMPOSITION OF WESTERN SANDPIPERS WINTERING IN CALIFORNIA

In most areas from which we obtained data on the sex of wintering Western Sandpipers in California males outnumbered the females by at least 2:1. Limantour Estero in contrast to Bolinas Lagoon has large numbers of wintering Western Sandpipers and in 1972-73 there were about 2000 Western Sandpipers at Limantour. We trapped 75 birds there in January and February 1973, of which 76% were adults. Males made up 89% of the adults and 94% of the immatures. At two locations on San Francisco Bay Western Sandpipers banded by Jurek during the winters of 1970-71 and 1971-72 were 90% males (Table 1). Farther south, at Anaheim Bay near Los Angeles, males made up 75% of the birds Jurek trapped during the winter of 1970-71, and at San Diego males made up 78% of those banded by Craig in 1969-70 (Table 1). In northern California, at Humboldt Bay, Gerstenberg (1972, Table 6) found that 78% of the adults and 67% of the immatures he trapped between October and March were males. Adults composed 61% of the 400 birds he caught. Gerstenberg's (1972) data are not strictly comparable with the data from the other locations we studied because the bill measurements he used to separate the sexes were different enough from our measure-

Table 1. Sex composition of Western Sandpipers at different locations. Birds of unknown sex were not included in the calculations of the percentages or in the sample sizes shown below.

Location	Inclusive Dates Banded	Percent Male	Percent Female	Sample size	Unknown sex
Bolinas Lagoon (38°N)	3 Oct. 1971-21 Mar. 1972	85.9	14.1	64	0
Limantour Estero (38°N)	24 Jan., 7 Feb., 1973	90.7	9.3	75	0
Oliver Brothers Salt Co. (San Francisco Bay) (37°N)	28-29 Oct. 1970 1 Jan. 1971	93.5	6.5	31	7
Palo Alto (37°N) (San Francisco Bay)	9-10 Nov., 8-10 Dec., 1971	89.6	10.4	69	6
Anaheim Bay (34°N)	18 Oct., 27-30 Nov., 1970 26-28 Feb. 1971	74.6	25.4	71	17
San Diego (33°N)	8 Oct. 1969-20 Mar. 1970	78.3	21.7	230	20
	Collected				
California Baja California	9 Oct.-20 Mar., 1882-1969	72.5	27.5	69	0
South Carolina Georgia Florida	26 Oct.-15 Mar., 1890-1959	65.5	34.5	29	0
South America West Indies	22 Jan.-1 Dec., 1893-1963	36.8	63.2	38	0

ments to change the sex ratios we calculated from our data.

In 69 study skins of Western Sandpipers collected from 9 October to 20 March, 1882 to 1969, from California and Baja California, 72% were males. Of the 21 study skins of adult birds 57% were males; and of the 48 study skins of immature birds 79% were males. Consequently, in the populations of wintering Western Sandpipers from California we examined, males outnumbered females. The degree to which males outnumbered females was significantly different ($P < 0.01$) from a 1:1 sex ratio and ranged from 3 males per female at Anaheim Bay to 14 males per female at one location on San Francisco Bay.

EVIDENCE THAT FEMALE WESTERN SANDPIPERS WINTER FARTHER SOUTH THAN MALES

From museum specimens of Western Sandpipers collected outside California there is some evidence that female birds winter farther south than the males. In 29 Western Sandpipers collected between 26 October and 15 March, 1890 to 1959, in South Carolina, Georgia, and Florida, males made up 65.5% of the specimens (Table 1). In the 17 specimens of adult Western Sandpipers 59% were males; in 12 immatures 75% were males. Although these samples are small they suggest that males also outnumber females in the winter populations of Western Sandpipers in the southeastern United States.

In 38 Western Sandpipers collected in the West Indies and South America at all times of the year between 1893 and 1963, only 37% of the birds were males (Table 1). In 24 winter specimens (19 October to 24 February) 5 of 15 adult birds were males and 3 of 9 immature birds were males. These are the only data we obtained on the populations of Western Sandpipers wintering south of the mainland United States. They suggest for this species that females outnumber males at the southern extremity of the wintering range. More data are obviously needed before a firm conclusion can be drawn on the status of males and females in the southern part of the Western Sandpipers' wintering range.

DISCUSSION

It is possible that in the species males outnumber females. Holmes (1971) studied Western Sandpipers on the Alaskan breeding grounds but gave no information to suggest an unequal sex ratio in breeding

birds. We examined 101 adult Western Sandpiper specimens collected in Alaska between 10 April and 26 July, 1896 to 1967; 64.4% were males, a ratio that differs significantly ($P < 0.01$) from the expected 1:1 sex ratio. Holmes (1971, 1972) found that male Western Sandpipers arrived on the breeding grounds slightly before the females and the males remained with the brood longer than their mates. These differences between the sexes of the Western Sandpiper plus the fact that the males take the lead in courtship and are always more likely to be shot than the inconspicuous females increase the likelihood of males being collected on the breeding grounds. In fact 5 of 7 Western Sandpipers collected in Alaska in April and 16 of 20 birds collected in July were males. From May and June only 59% of 67 birds from Alaska were males. This does not differ significantly ($P > 0.05$) from the 1:1 sex ratio expected in breeding populations of Western Sandpipers.

The use of study skins to determine the sex ratio of breeding or migrating birds is unsatisfactory, since many factors involved in the collecting of the specimens were unknown to us. Consequently, further studies of the age and sex composition of Western Sandpipers at other locations on the wintering grounds and on the breeding grounds are necessary to supplement this study.

SUMMARY

Banding studies and censuses indicate that the Western Sandpiper is primarily a migrant at Bolinas Lagoon. In autumn adult Western Sandpipers reach this estuary a month prior to the immature birds, and in spring males on their way to Alaska pass through Bolinas Lagoon prior to most females. In spring and winter males outnumber females. Banding studies and data from museum specimens suggest that a large proportion of adult and immature male Western Sandpipers remain in North America during the winter, whereas a large proportion of the females move farther south.

ACKNOWLEDGEMENTS

Many volunteers of Point Reyes Bird Observatory helped to census and trap Western Sandpipers on Bolinas Lagoon, particularly: David Anderson, David Bly, William Clow, Kate Darling, William Fitzgerald, William Kenyon, Beverley McIntosh, Elizabeth Meyers, Gregory Richard, Richard Scheible, Lynne Stenzel, and Alice Williams. Leo

Karl provided programs for computer analysis of the data. Alan M. Craig, R. H. Gerstenberg, and Jurek collected banding data as part of California Department of Fish and Game federally funded shorebird research programs (Pittman-Robertson Project W-54-R and Accelerated Research on Shore and Upland Migratory Game Birds). The curators of ornithology in the following institutions made Western Sandpiper specimens available for our examination: San Diego Natural History Museum, Museum of Vertebrate Zoology, California Academy of Sciences, Oregon State University, University of Puget Sound, Washington State Museum, University of Alaska, Royal Ontario Museum, and American Museum of Natural History. Laurence C. Binford made storage space available at the California Academy of Sciences for specimens. David G. Ainley, Joseph R. Jehl, Jr., and John Smail read an original draft of the manuscript and offered many helpful suggestions. This is Contribution 67 of Point Reyes Bird Observatory.

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NOTES

AMERICAN REDSTART BREEDING IN CALIFORNIA

McCaskie (1970) has summarized the status of the American Redstart *(Setophaga ruticilla)* in California. He considers it a normal fall migrant and a late spring vagrant, occurring regularly in small numbers throughout much of the state, and a rare, local winter resident in the south. He treats June and July birds as vagrants that have become hopelessly lost. The breeding range according to the American Ornithologists' Union (1957) extends west and south to southwestern British Columbia, central northern Washington, eastern Oregon, and northern Utah. However, the closest definite breeding locality that we can find is in southwestern Oregon 15 miles north of Medford, Jackson Co., and 210 km northeast of Arcata, California (Crowell and Nehls, 1970); this nest contained four young when discovered on 2 July 1970 among willows along the Rogue River (John Butler, *fide* Guy McCaskie). Other summer records from farther northeast in Oregon (Gabrielson and Jewett, 1940; Quaintance, 1942) suggest breeding on a somewhat regular basis.

In 1972 a pair of American Redstarts nested in a small alder-willow bog approximately 5 km northwest of Arcata, Humboldt Co., California. More exactly, this locality is at the west end of Lanphere Road, 2.0 km from its junction with Seidel Road, where Lanphere branches into two private dirt roads, and is on the west shore of Mad River Slough 0.8 km from the Pacific Ocean.

Early in the afternoon of 22 July 1972 we visited this bog. Standing on the south branch of Lanphere Road near its bifurcation, we began "shushing." Almost immediately an adult male American Redstart appeared, scolded briefly, and flew back into the woods. A few seconds later an adult female arrived from the direction in which the male had disappeared. She was not very excited and did not scold, but instead flitted from branch to branch collecting insects. After accumulating a billful, she disappeared into the trees. Binford followed into the mosquito-infested bog and soon found the male, which was calling and singing intermittently while collecting food. Spotting an intruder, the bird began scolding loudly but retained the food in his bill and remained high in the trees. After a few minutes he disappeared into the canopy almost directly above Binford. The female was then noted collecting food some 25 m away. While Binford watched, she flew to the tree in which the male was last seen and went directly to the nest.

The nest was saddled in a crotch between four small vertical branches about 8 m above the ground in the canopy of a Scouler Willow *(Salix scouleriana)*, which was 18 cm in diameter at breast height and about 10 m tall. On 10 August the empty nest was collected by Gary Friedrichsen and Tim Osborne and is now in the collection of the California Academy of Sciences. It is composed largely of the dried stem fragments of herbaceous plants, notably of the genera *Equisetum, Stachys,* and *Scirpus.* Moss, cottony fibers attached to willow seeds, body hair from horses, and miscellaneous plant debris account for the remainder of the nest bulk. The lining is composed solely of hair from the tails or manes of horses. There is a stable about 35 m from the nest site. Dimensions of the slightly dilapidated nest are as follows: diameter, outside 75 mm, inside 35; depth, outside 55, inside 30.

Alder-willow thickets form a narrow strip bordering Mad River Slough. Between the thickets and the ocean is a series of sandy ridges supporting mixed woodland. At the nest site a tiny stream spreads underground forming a bog, in which are growing Pacific Oenanthe *(Oenanthe sarmentosa)*, Giant Horsetail *(Equisetum telmateia* var. *braunii)*, Chamisso Hedge-nettle *(Stachys chamissonis)*, and Bulrush *(Scirpus macrocarpus)*. Here the dominant trees are Scouler Willow, 9 to 12 m tall, and alder *(Alnus* sp.), some of which are even taller.

On 23 July we again visited the locality, accompanied by a large group of people, including Ted Chandik, Dave DeSante, Gary Friedrichsen, Douglas Greenberg, Tom Schulenberg, and Bob Yutzy. Chandik photographed each adult at the nest (Figure 1; color print on file at the California Academy of Sciences). During an hour of observation the Redstarts seemed to exhibit a regular routine. The female would collect food, feed the young, and then brood them loosely until the male appeared. When he was still some 3 m away she would leave. After about a minute the male would land at the nest, feed the young, and leave immediately. On one occasion he reached the nest before the female had left and transferred his food to her. We could not determine if she ate it or gave it to the nestlings. As he did on 22 July, Stallcup saw the head of one nestling and believed the bird was three or four days old, as its crown supported only wispy down rather than contour feathers. The adults seemed to jab in three distinct places in the nest, suggesting that there were at least three nestlings.

FIGURE 1. Adult male American Redstart *(Setophaga ruticilla)* at its nest near Arcata, Humboldt County, California on 23 July 1972.

Photo by Theodore Chandik

On 29 July Stallcup, Friedrichsen, and Ronald LeValley observed the nest for 20 minutes. Three times the male Redstart fed a juvenal Brown-headed Cowbird *(Molothrus ater)* that was concealed in the foliage about 2 meters below the nest. The very short tail, bold yellowish gape, and long down feathers on the crown indicated that it had left the nest quite recently. At no time did the male approach the nest. Although no female or fledgling Redstart was seen, the entire area was not searched thoroughly.

The American Redstart has had an interesting history at the Lanphere Road locality. A male was reported in the summer of 1969, but the observation was never confirmed. On 26 June 1970 an adult male was seen by Dr. Stanley W. Harris and was reported by other observers to have been present for the previous three or four weeks. The area was not checked in 1971. In 1972 an adult male was seen on 1 June by Dick Erickson and Osborne and on the following day by Harris, but no female was seen before 22 July. Whether or not the male had a mate and nest in previous years is unknown.

The only other records we can find for northwestern California are as follows: one young male seen by W. L. Dawson and A. G. Vrooman on 14 June 1916 in northern Mendocino Co. (Dawson, 1923); single females seen by Stallcup on 23 and 24 Sep. 1961 along the west slope of Clear Lake, Lake Co., and on 16 Sep. 1967 at Trinidad, Humboldt Co.; one bird observed by Stallcup on 17 Sep. 1967 at Fairhaven, on the north spit of Humboldt Bay, Humboldt Co.; and single males observed by Ron H. Gerstenberg on 30 Aug. 1970 and 2 and 3 Sep. 1971 at Manila, on the north spit of Humboldt Bay, Humboldt Co. (DeSante et al., 1972; Gerstenberg, *in litt.).*

Grinnell and Miller (1944) do not list the 1916 record, perhaps taking too literally Dawson's statement that the observers obtained only "a rather regrettably unsatisfactory glimpse." We feel that the record should be accepted, because the observers had a view sufficient to determine sex and age and considered the record worthy of publication. Possibly Dawson made his statement because the bird was not collected. North Spit appears to be a natural landfall for displaced vagrants returning from the ocean. Its proximity to the Lanphere locality suggests that it might have been the immediate source of the nesting birds.

The nest described here is the first for California. The alder-willow association is fairly common along the northern coast of the state and could harbor additional breeding pairs of American Redstarts and possibly other species of supposed "eastern vagrants."

We are indebted to Dr. Elizabeth McClintock of the California Academy of Sciences for identifying the habitat plants and nest materials. Dave DeSante, Dr. Stanley W. Harris, Ron H. Gerstenberg, Lloyd F. Kiff, and Guy McCaskie kindly supplied data on American Redstart records, and Ted Chandik generously provided the photograph.

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PAINTED BUNTING RECORD FOR NORTHEASTERN CALIFORNIA

On the morning of 17 April 1972 an adult male Painted Bunting (*Passerina ciris*) was observed on a feeder at the University of California's Sagehen Creek Field Station, approximately 8 miles northwest of Truckee, California. The bird was seen on the feeder or in nearby trees several times during the day. It was collected on 18 April and stored in a freezer at the research station pending preparation as a specimen. The Painted Bunting was rather wary and flew out of sight into nearby pine trees several times when I attempted to approach within collecting range. After a brief period, approximately 30 minutes, the bird would return to the feeder or vicinity. On the fourth attempt I was able to approach close enough to collect the Painted Bunting. The bird was associating with Mountain Chickadees (*Parus gambeli*) that were using the feeder. To my knowledge this is the first record of a Painted Bunting occurring in northeastern California. The Painted Bunting is listed as irregular, accidental, or casual in California (McCaskie et al., 1970).

The possibility that this bird was an escapee should not be ignored since Painted Buntings are sold in pet shops. A scar 7 mm by 5 mm, which could have been incurred while caged, was found on the bird's head between the orbits. Painted Buntings normally arrive along the Gulf Coast close to the time I observed the bird at Sagehen Creek (Lowery, 1960) and for it to stray so far from its normal course in the same amount of travel time would be unusual. Eastern species that stray into California in spring usually appear from late May to mid-June. However, the bird's wary behavior and the rather remote location of the Sagehen Creek Station tend to reduce the likelihood of the bird being an escapee. The towns nearest the station are Sierraville, 12 miles to the north and Truckee, 8 miles to the south. Reno, Nevada is situated approximately 35 miles east of the station.

Published accounts of previous Painted Bunting sightings in California have recorded this species primarily in the southern part of the state. Chase and Chandik (1966), McCaskie et al. (1967) and McCaskie (1972a, 1972b) reported sightings of 8 individual Painted Buntings in female plumage. Six of these were in southern California. The 7 adult male Painted Buntings seen in California were reported by Baldridge and Chandik (1969) and McCaskie (1968, 1972b, and 1973). Sightings of adult males in metropolitan areas have been treated as escapees, however specimens of immatures have been taken within California during the autumn indicating that stragglers do reach the state (McCaskie, 1973). The 3 male Painted Buntings reported by McCaskie (1973) were sighted far from metropolitan areas.

The one record of a Painted Bunting north of the Sagehen Creek Station was of a male collected at Malheur National Wildlife Refuge in Oregon (Kridler, 1965).

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OBSERVATIONS ON THE NEST BEHAVIOR OF THE CALIFORNIA SCRUB JAY

To our knowledge no one has reported sustained observations of the nest behavior of the California Scrub Jay (*Aphelocoma coerulescens*). Incomplete observations of one nest were reported by Michener and Michener (1945). On 28 March 1972 we found a completed nest on a steep ravine about five feet from the ground in a Toyon (*Heteromeles arbutifolia*) on the Point Reyes National Seashore in Marin Co., California. We watched the nest from a blind 30 feet away for 61 hours and 53 minutes on the 2nd, 5th, 6th, 7th, 8th, 10th, 11th, and 17th days after the first egg hatched and once during the incubation period. Since the parents had been color banded previously we knew that the female was 4 years old and the male at least 3.

The female laid 5 eggs and incubation lasted 18 days. Bent (1946) reported that incubation was 14 to 16 days. The male was not observed incubating. During the only sustained observation of adults during the incubation period, the female sat on the eggs for 3 hours and 7 minutes before leaving the nest. During the 51 minutes she was off the nest she ranged over most of the defended territory. The young hatched one at a time during a two-day period. The night after the last young hatched it rained and the next morning at 0600 the female was observed taking a dead nestling from the nest. The last nestling to hatch was noticeably smaller than the earlier ones; we assume, therefore, that because of the rain and because the youngest nestling was probably the weakest, that this nestling died.

When the eggs hatched the male began to bring food to the female and the nestlings. Upon arriving at the nest he would poke his beak as far as he could into the female's mouth transferring some of his food to her. Then usually both parents fed the nestlings. The number of trips made by the male was relatively constant until day 10 but increased after that (Figure 1). The female began bringing food to the nest for the young on day 7. The increase in feeding trips to the nest by the female on day 11 coincided with her cessation of brooding the young (Figures 1 and 2). At this time the male stopped feeding the female at the nest.

Some time between day 14 and 16 another nestling died. When we color banded the nestlings on day 10 this nestling had the least developed plumage so we assume the nestling that died was the youngest in the nest at that time.

The first young jay left the nest during the afternoon of day 24. Bent (1946) reported that young are able to leave the nest in 18 days. His behavior during the previous 2 days suggested that he was ready to leave. He would jump back and forth across the nest when the parents came to feed, occasionally hopping out when the parents left, but returning each time to snuggle into the nest with the other young. When he finally left the nest for food, one of the other nestlings stood in the nest looking in his direction and making crying sounds. This behavior continued for some time. The second remaining nestling, on the other hand, just sat in the nest with no apparent concern. The next day these two nestlings also left (day 25), but a small pile of young jay feathers found later about 15 feet from the undisturbed nest suggested that one young was killed by a predator after leaving. It appears, therefore, that two of the original five young survived.

Throughout the nesting period the parent birds vigorously defended their territory against all other Scrub Jays and they were the only adults we observed

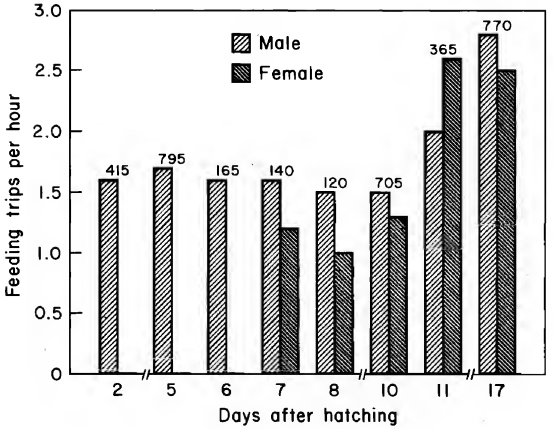

Figure 1. Average number of feeding trips to nest by Scrub Jay pair. Numbers above the bars represent minutes of observation.

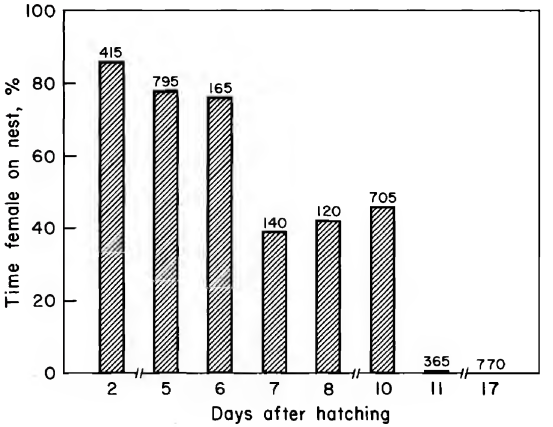

Figure 2. Percent of time female Scrub Jay brooded young. Numbers above the bars represent minutes of observation.

feeding the nestlings.

We thank Kate Darling, Sharon Long, Keller McDonald and Jim Higbee for their observations at the nest and Nick Story for drawing the figures. This is Contribution 57 of the Point Reyes Bird Observatory.

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Sketch by Tim Manolis

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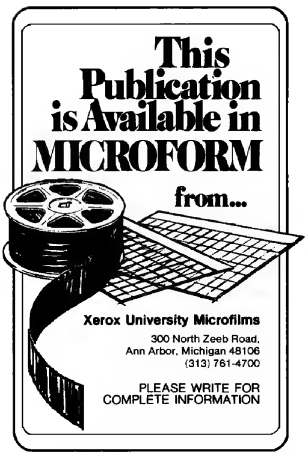

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